Application No.: 10/683,872
Filed: October 10, 2003
Group Art Unit 1756

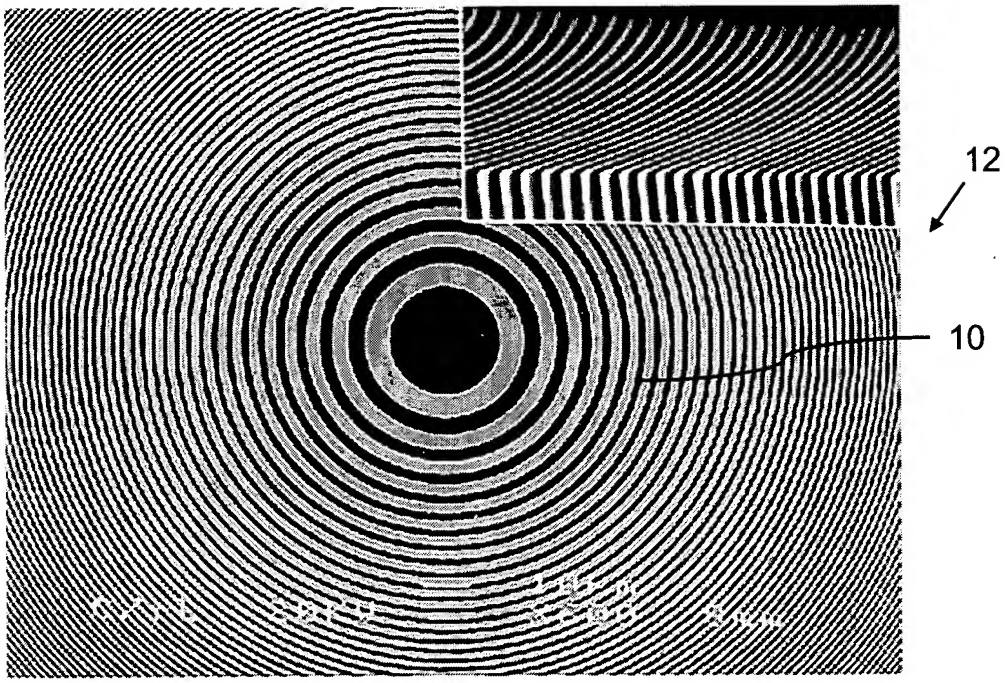

FIG. 1

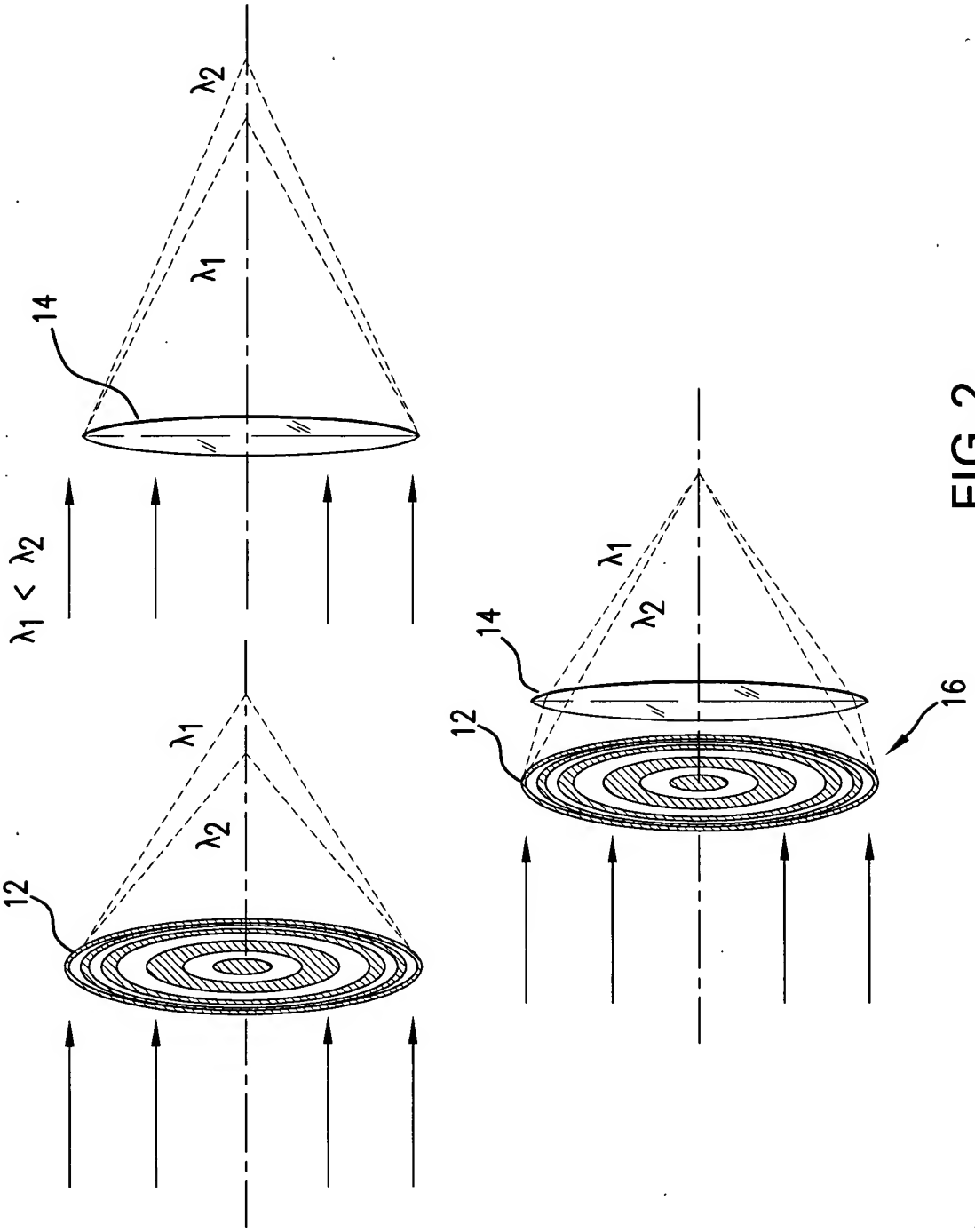

FIG.2

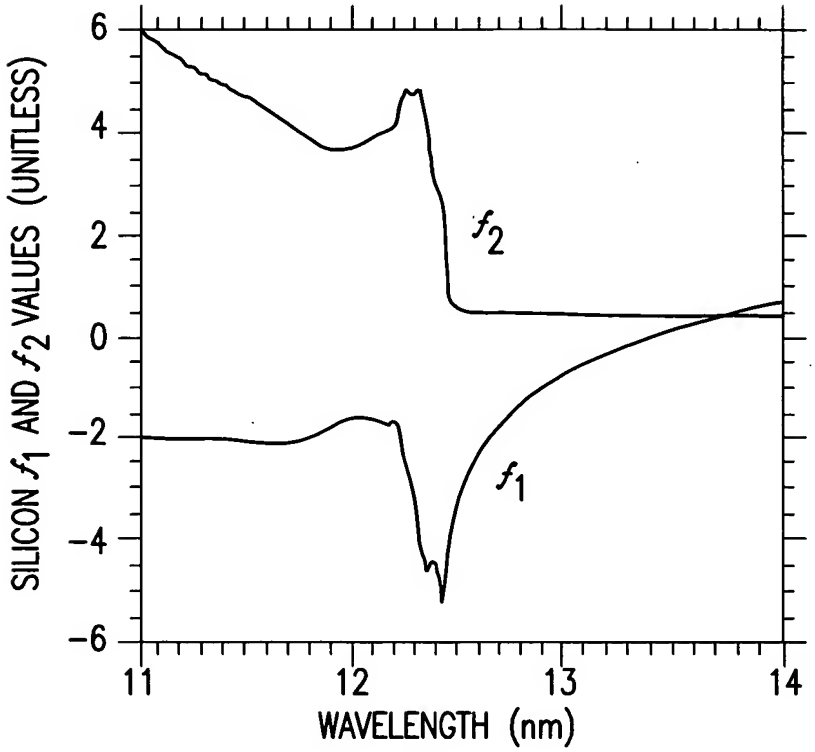
SILICON f_1 AND f_2 VALUES (UNITLESS)
6
4
2
0
−2
−4
−6
f_2
f_1
11
12
13
14
WAVELENGTH (nm)

FIG.3

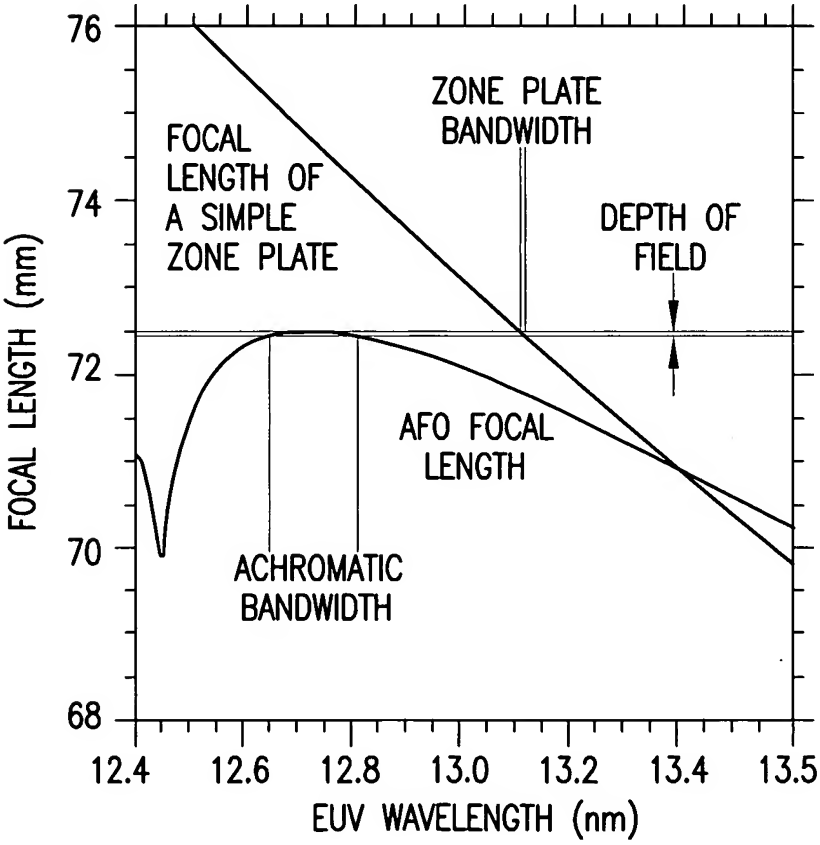
FOCAL LENGTH (mm)
76
74
72
70
68
FOCAL LENGTH OF A SIMPLE ZONE PLATE
ZONE PLATE BANDWIDTH
DEPTH OF FIELD
AFO FOCAL LENGTH
ACHROMATIC BANDWIDTH
12.4
12.6
12.8
13.0
13.2
13.4
13.5
EUV WAVELENGTH (nm)

FIG.4

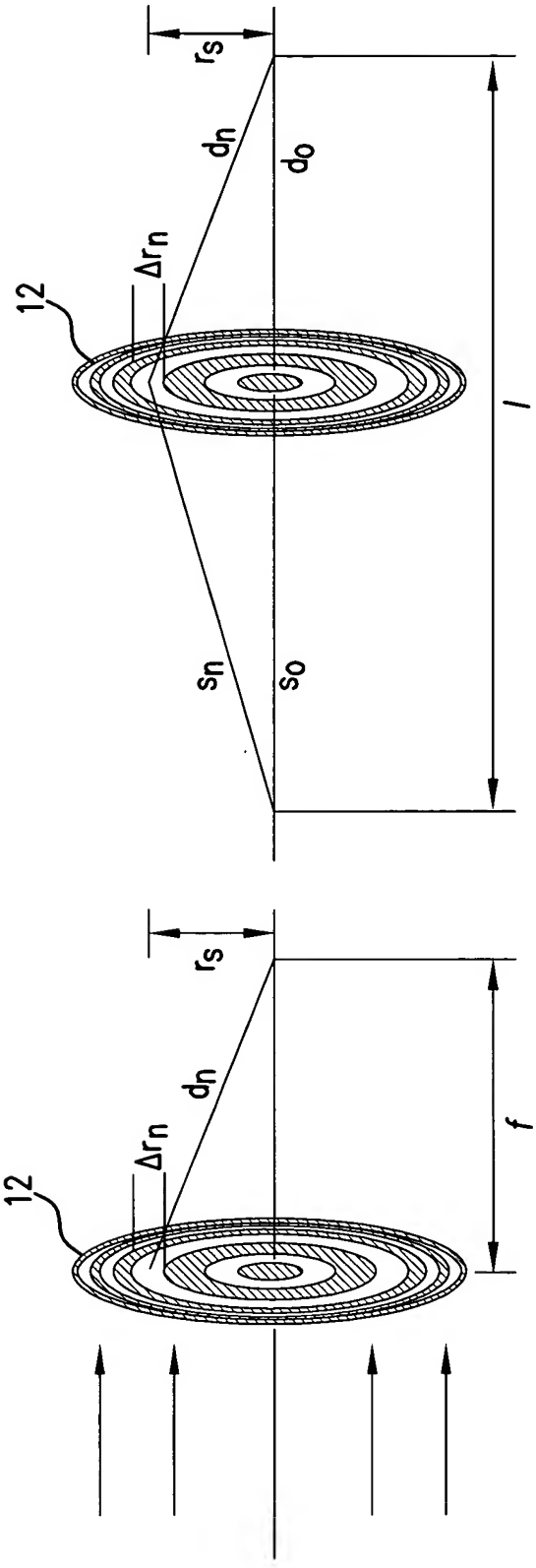
12
r_s
d_n
d_o
Δr_n
s_n
s_o
l
$s_n+d_n=s_o+d_o+n\lambda$
ZONE PLATE FOR IMAGING SPECIFIC FINITE CONJUGATES.
12
r_s
d_n
Δr_n
f
$d_n=f+n\lambda$
ZONE PLATE FOR INFINITY IMAGING.

FIG.5

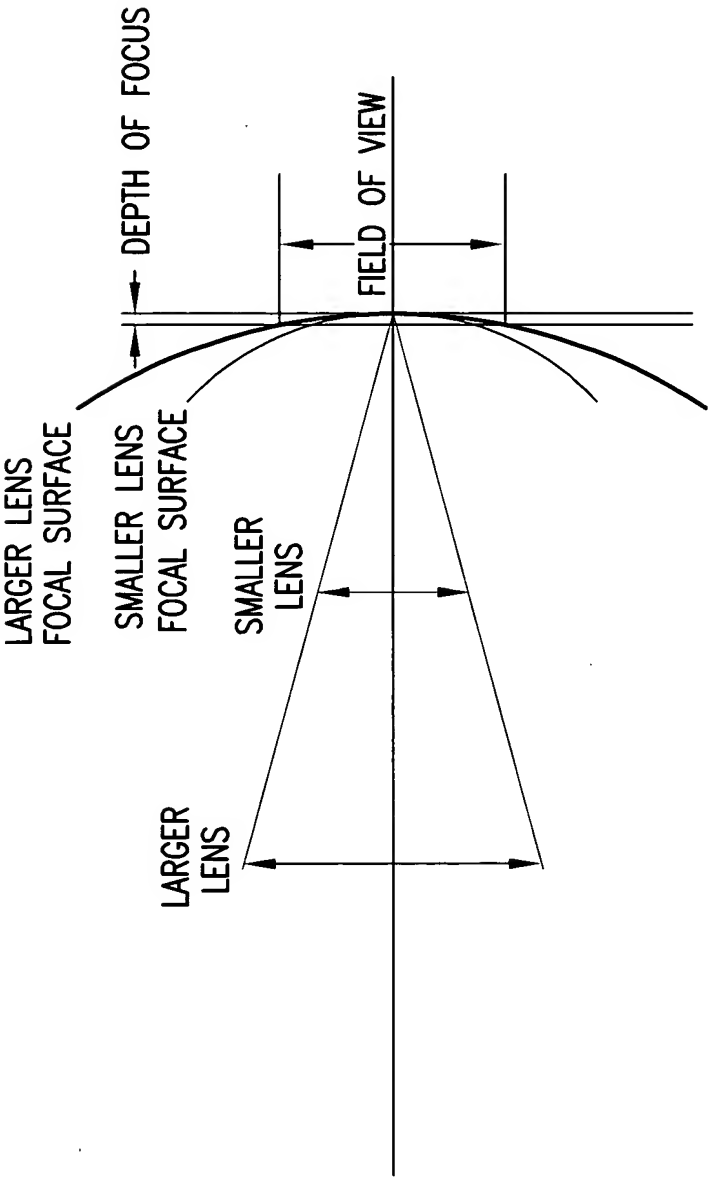
DEPTH OF FOCUS
FIELD OF VIEW
LARGER LENS FOCAL SURFACE
SMALLER LENS FOCAL SURFACE
SMALLER LENS
LARGER LENS

FIG.6

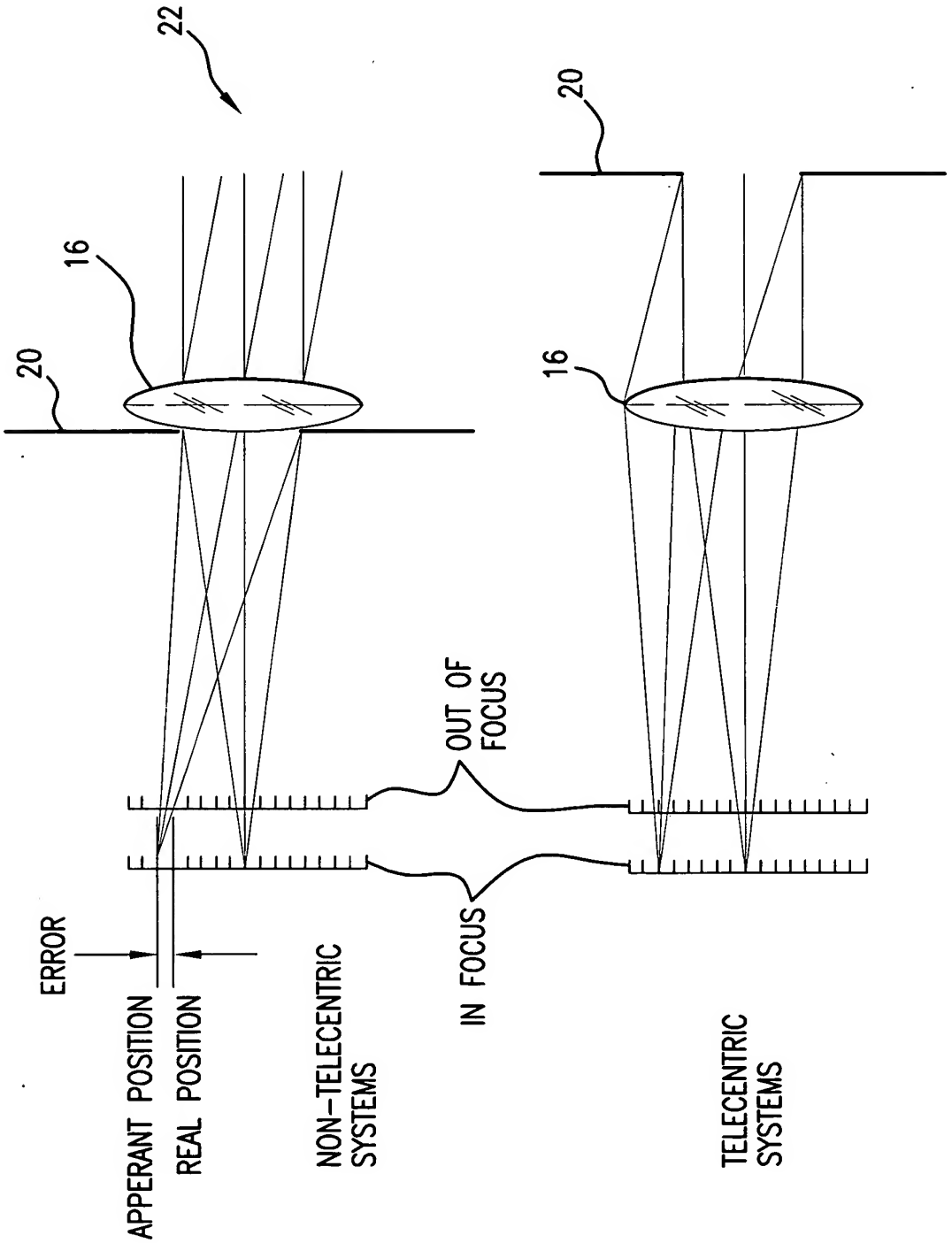
22
16
20
20
16
OUT OF FOCUS
ERROR
APPERANT POSITION
REAL POSITION
NON-TELECENTRIC SYSTEMS
IN FOCUS
TELECENTRIC SYSTEMS

FIG.7

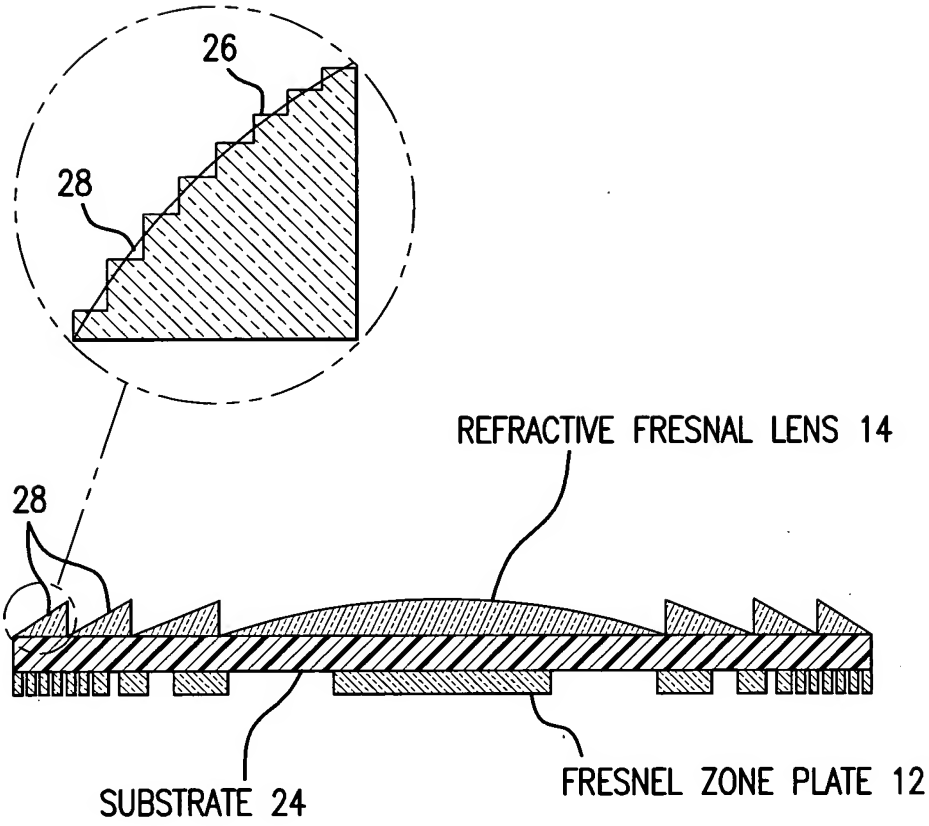
26
28
REFRACTIVE FRESNAL LENS 14
28
SUBSTRATE 24
FRESNEL ZONE PLATE 12

FIG.8

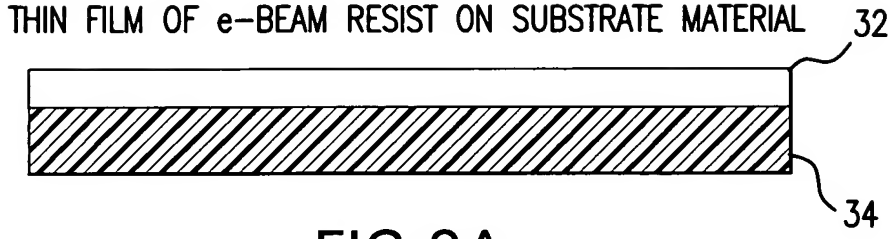

FIG.9A

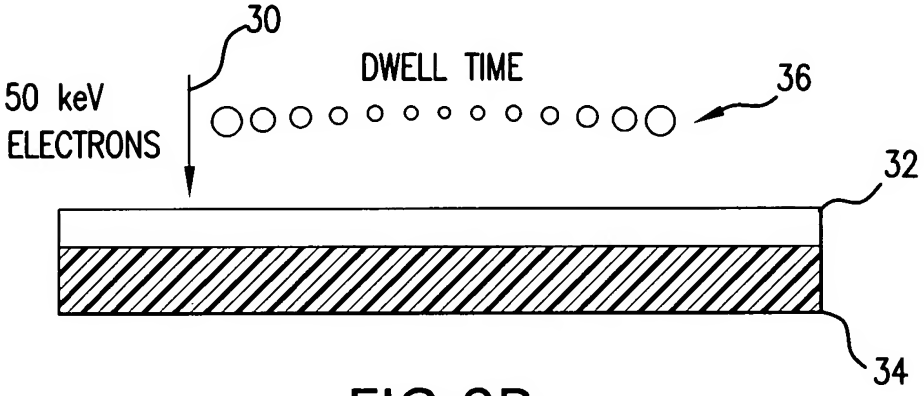

FIG.9B

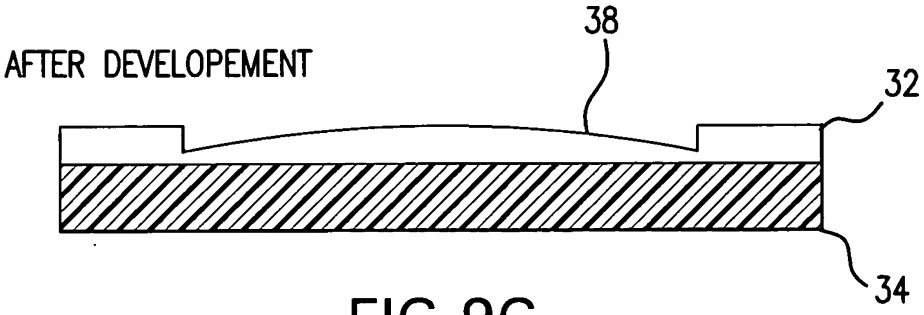

FIG.9C

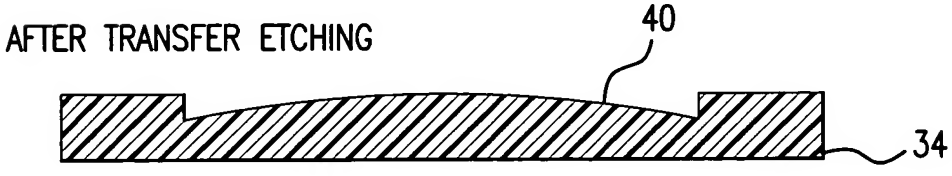

FIG.9D

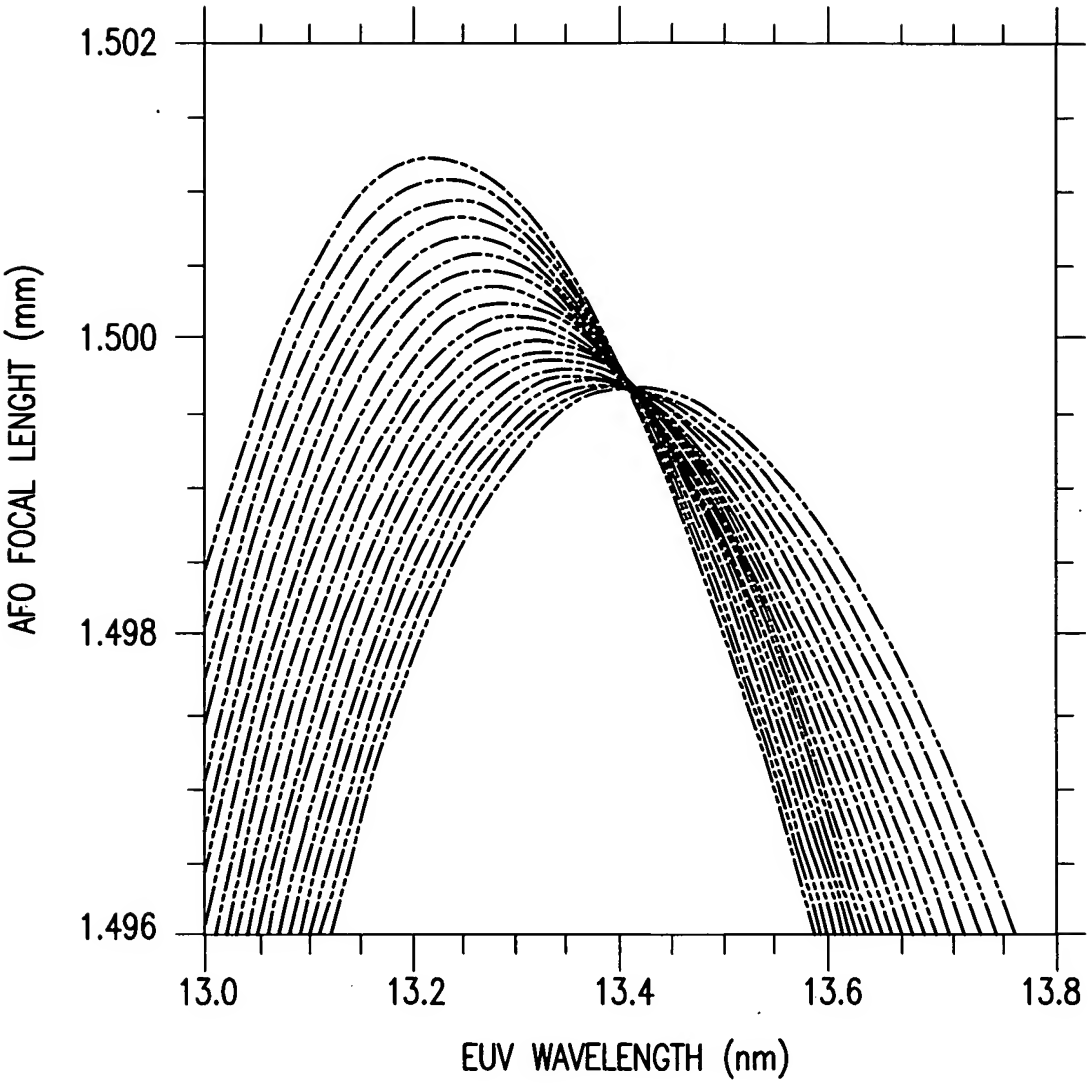
1.502
1.500
1.498
1.496
AFO FOCAL LENGHT (mm)
13.0
13.2
13.4
13.6
13.8
EUV WAVELENGTH (nm)

FIG.10

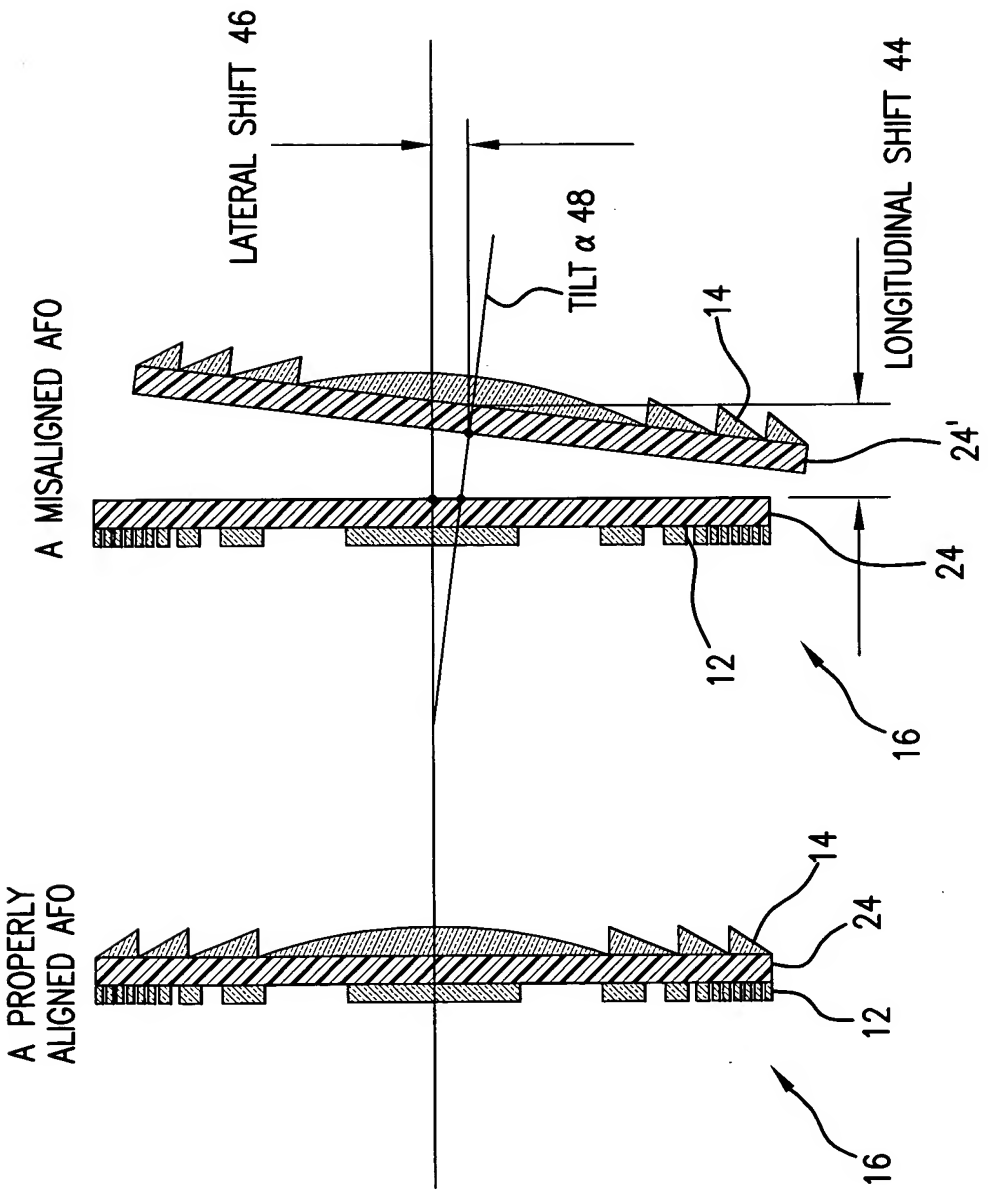
LATERAL SHIFT 46
TILT α 48
LONGITUDINAL SHIFT 44
A MISALIGNED AFO
14
24'
24
12
16
A PROPERLY ALIGNED AFO
14
24
12
16

FIG. 11

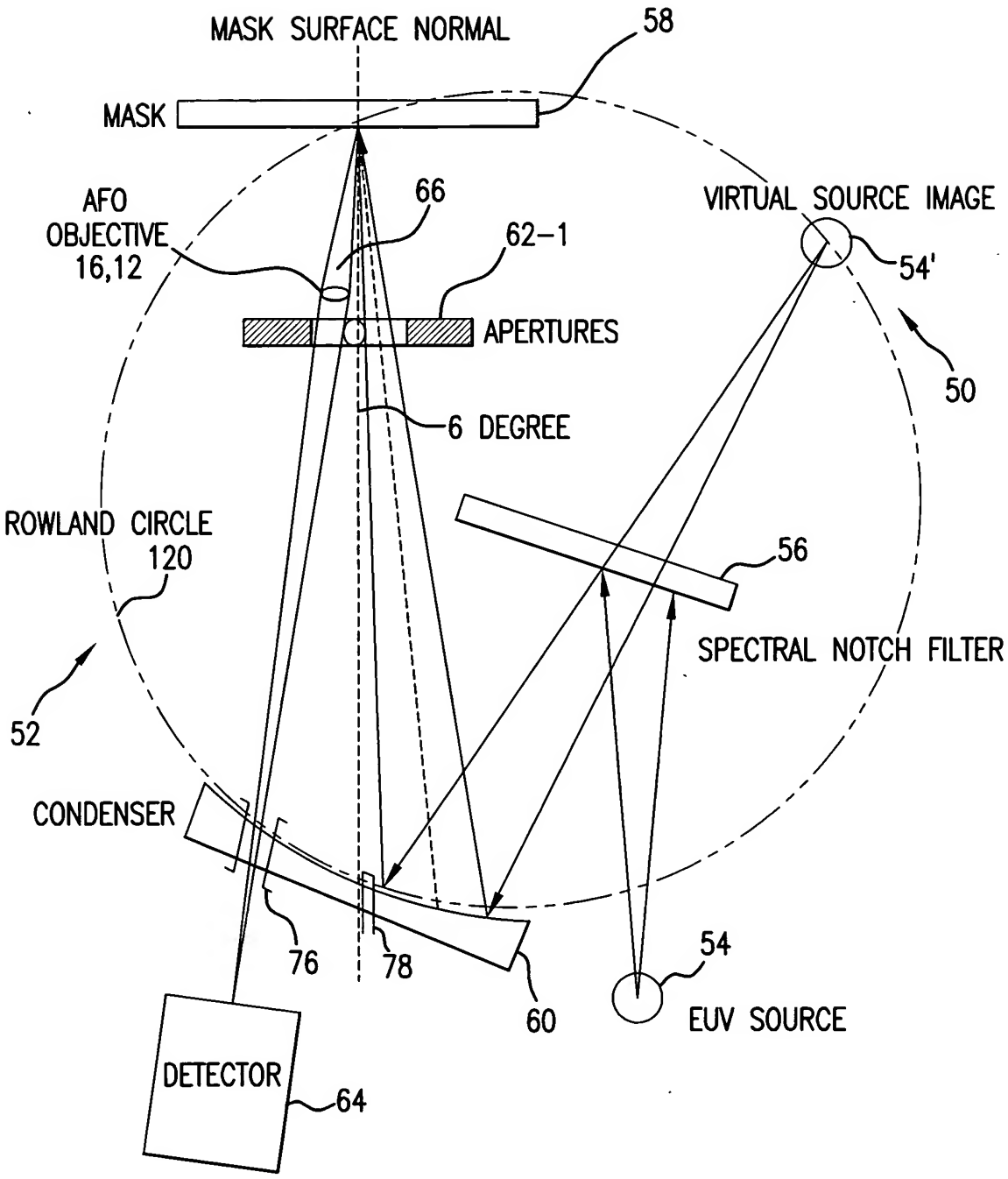
MASK SURFACE NORMAL
58
MASK
AFO
OBJECTIVE
16,12
66
62-1
VIRTUAL SOURCE IMAGE
54'
APERTURES
50
6 DEGREE
ROWLAND CIRCLE
120
56
SPECTRAL NOTCH FILTER
52
CONDENSER
76
78
54
60
EUV SOURCE
DETECTOR
64

FIG.12

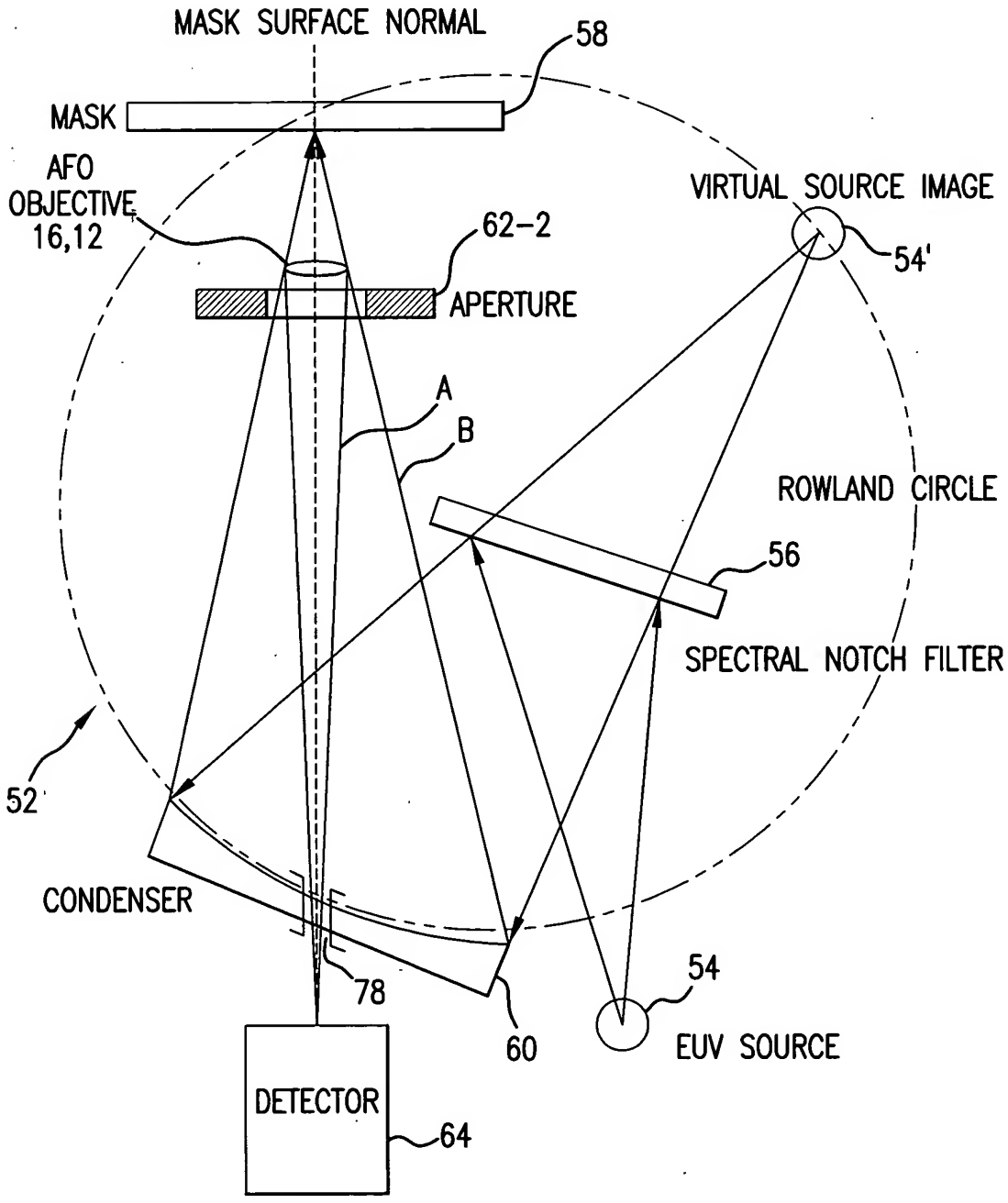
MASK SURFACE NORMAL
58
MASK
AFO
OBJECTIVE
16,12
62-2
APERTURE
VIRTUAL SOURCE IMAGE
54'
A
B
ROWLAND CIRCLE
56
SPECTRAL NOTCH FILTER
52
CONDENSER
78
60
54
EUV SOURCE
DETECTOR
64

FIG.13

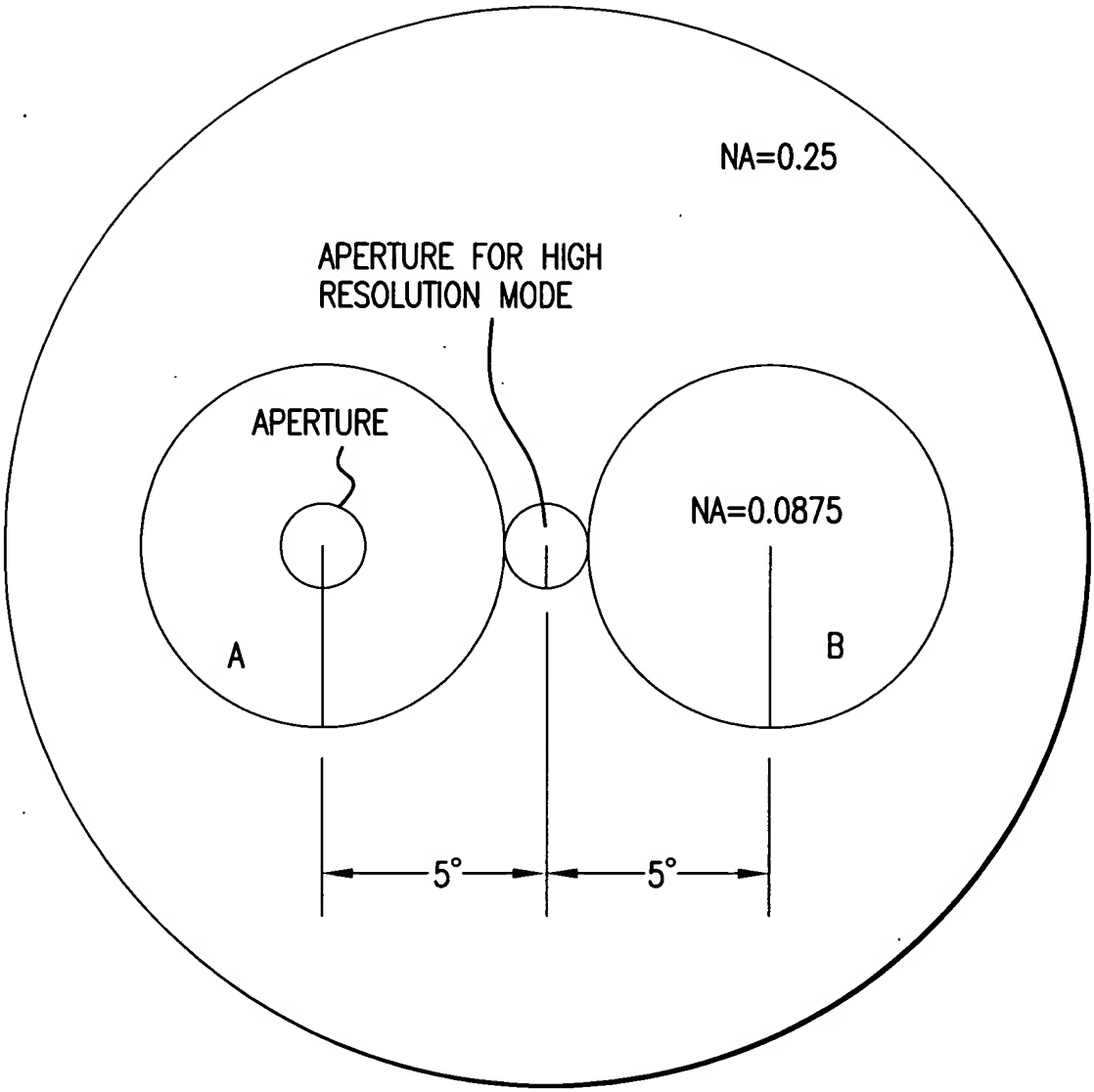
NA=0.25
APERTURE FOR HIGH RESOLUTION MODE
APERTURE
NA=0.0875
A
B
5°
5°

FIG. 14

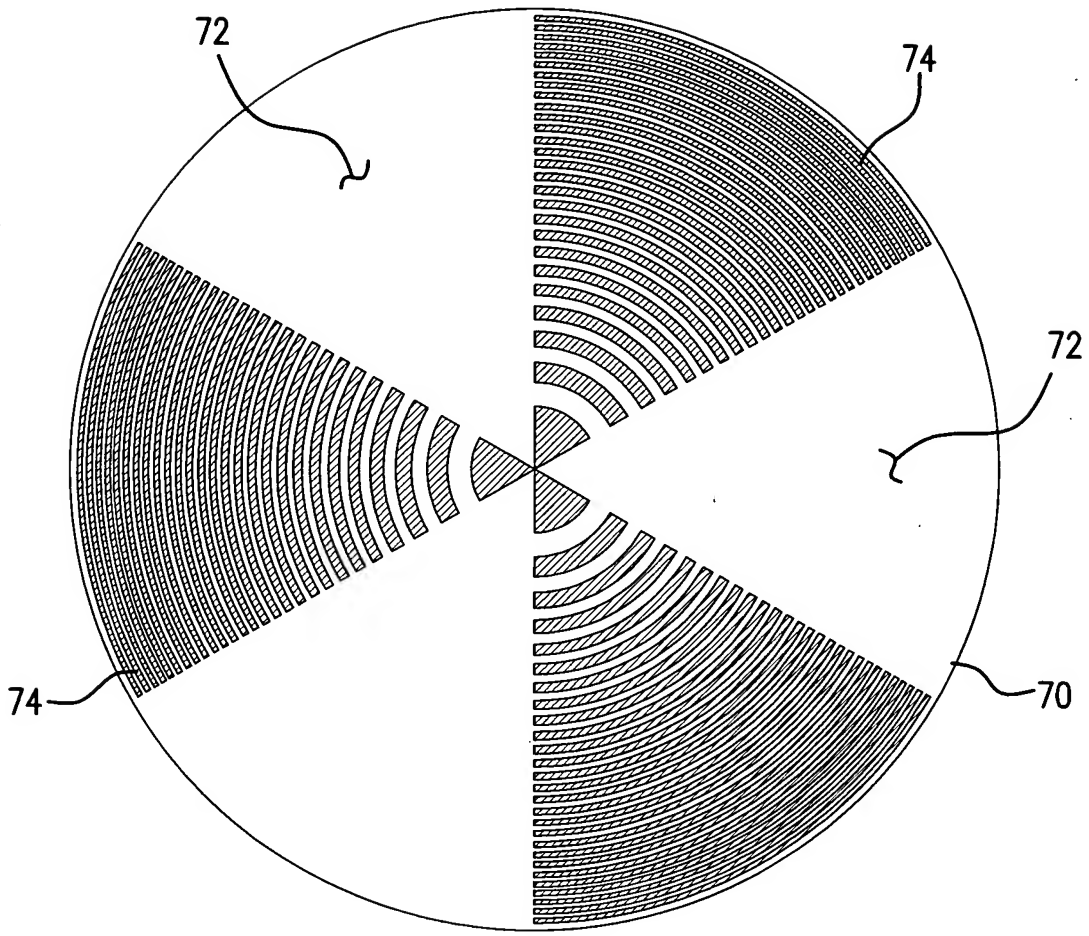

FIG. 15

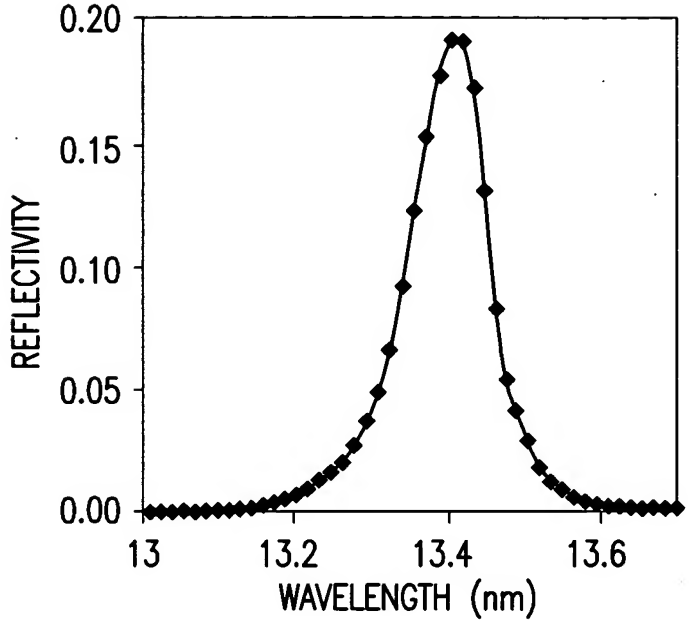

FIG.16A

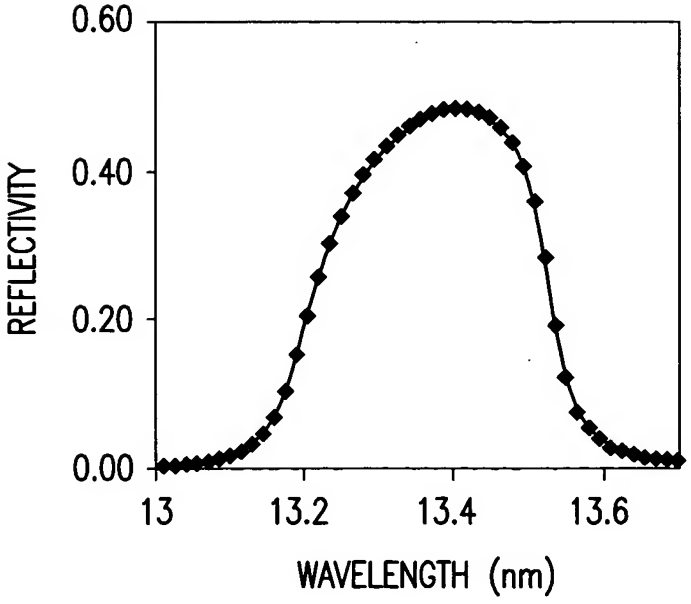

FIG.16B

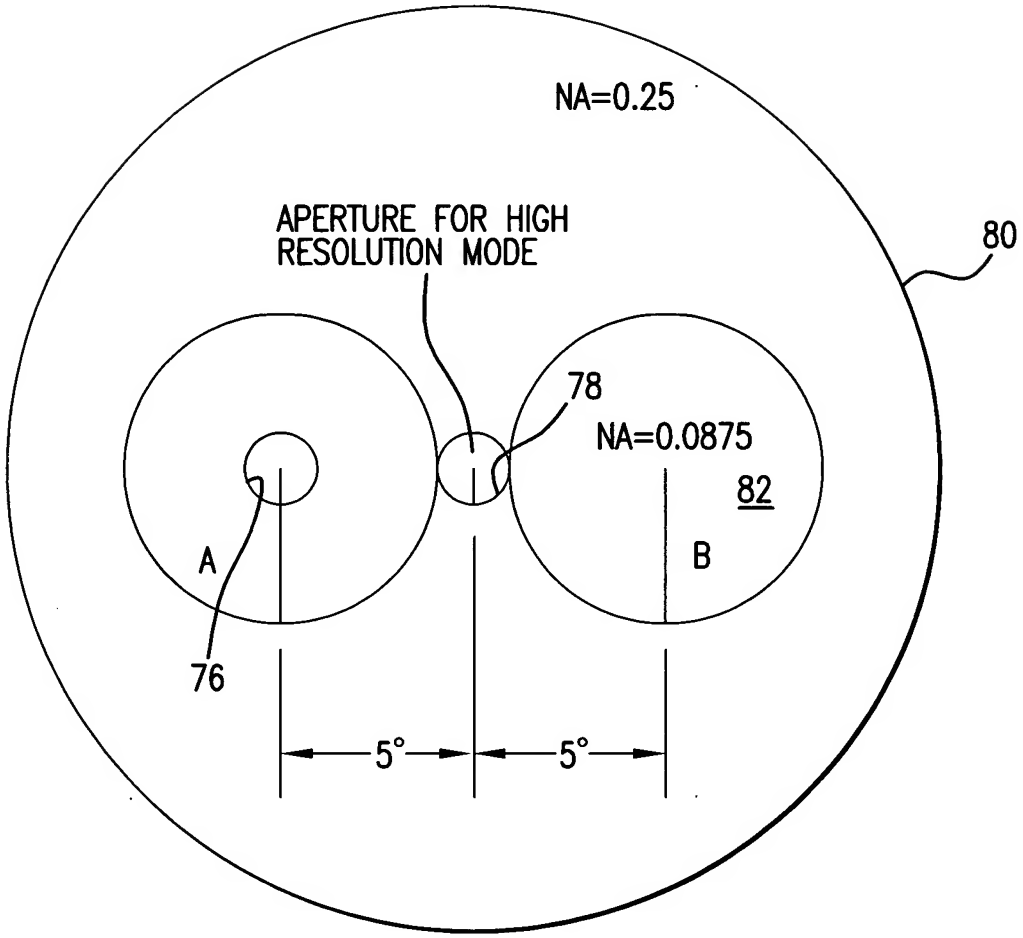
NA=0.25
APERTURE FOR HIGH RESOLUTION MODE
80
78
NA=0.0875
82
A
B
76
5°
5°

FIG.17

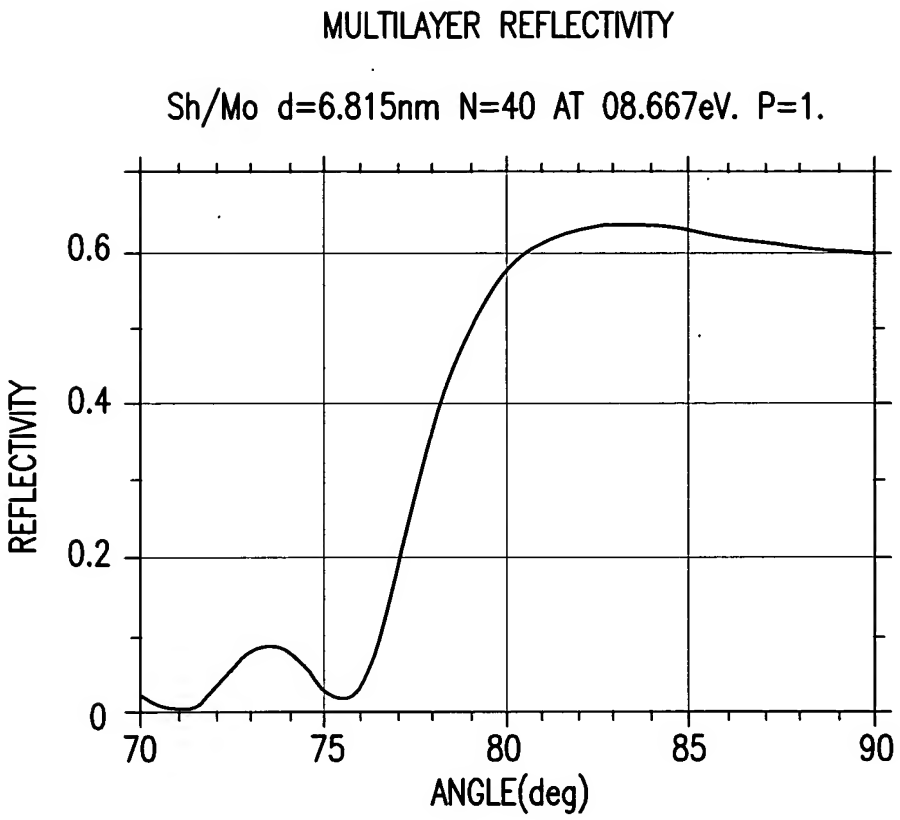
MULTILAYER REFLECTIVITY
Sh/Mo d=6.815nm N=40 AT 08.667eV. P=1.
REFLECTIVITY
0
0.2
0.4
0.6
70
75
80
85
90
ANGLE(deg)

FIG.18

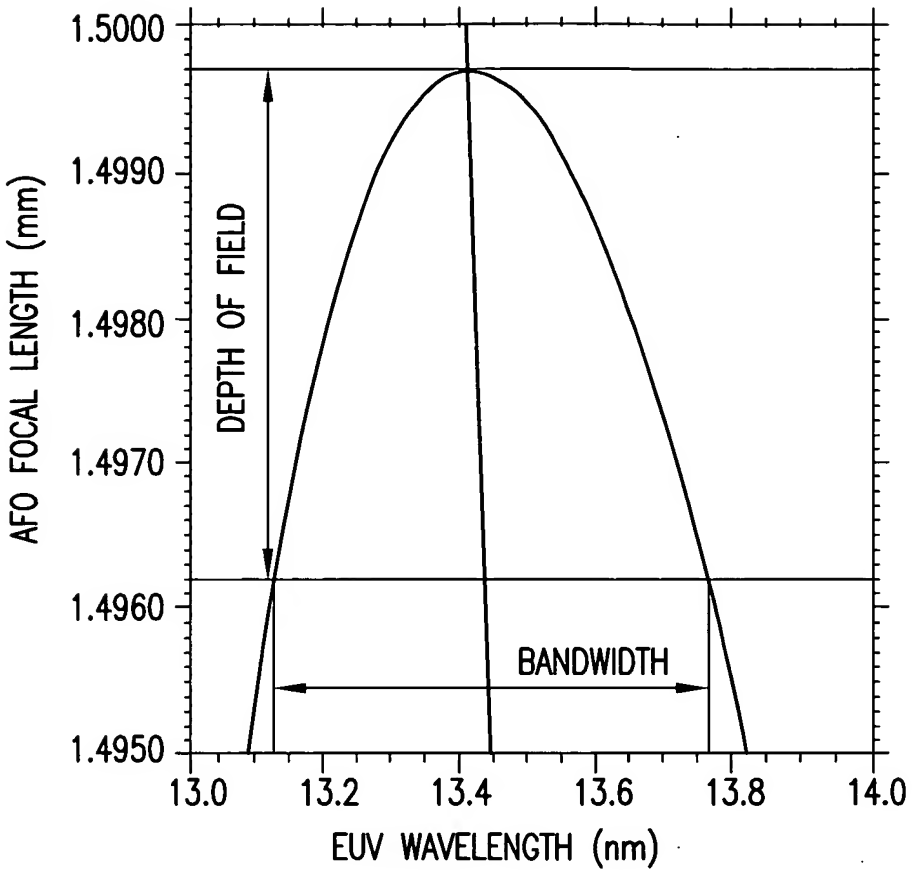
1.5000
1.4990
1.4980
1.4970
1.4960
1.4950
AFO FOCAL LENGTH (mm)
DEPTH OF FIELD
BANDWIDTH
13.0
13.2
13.4
13.6
13.8
14.0
EUV WAVELENGTH (nm)

FIG.19

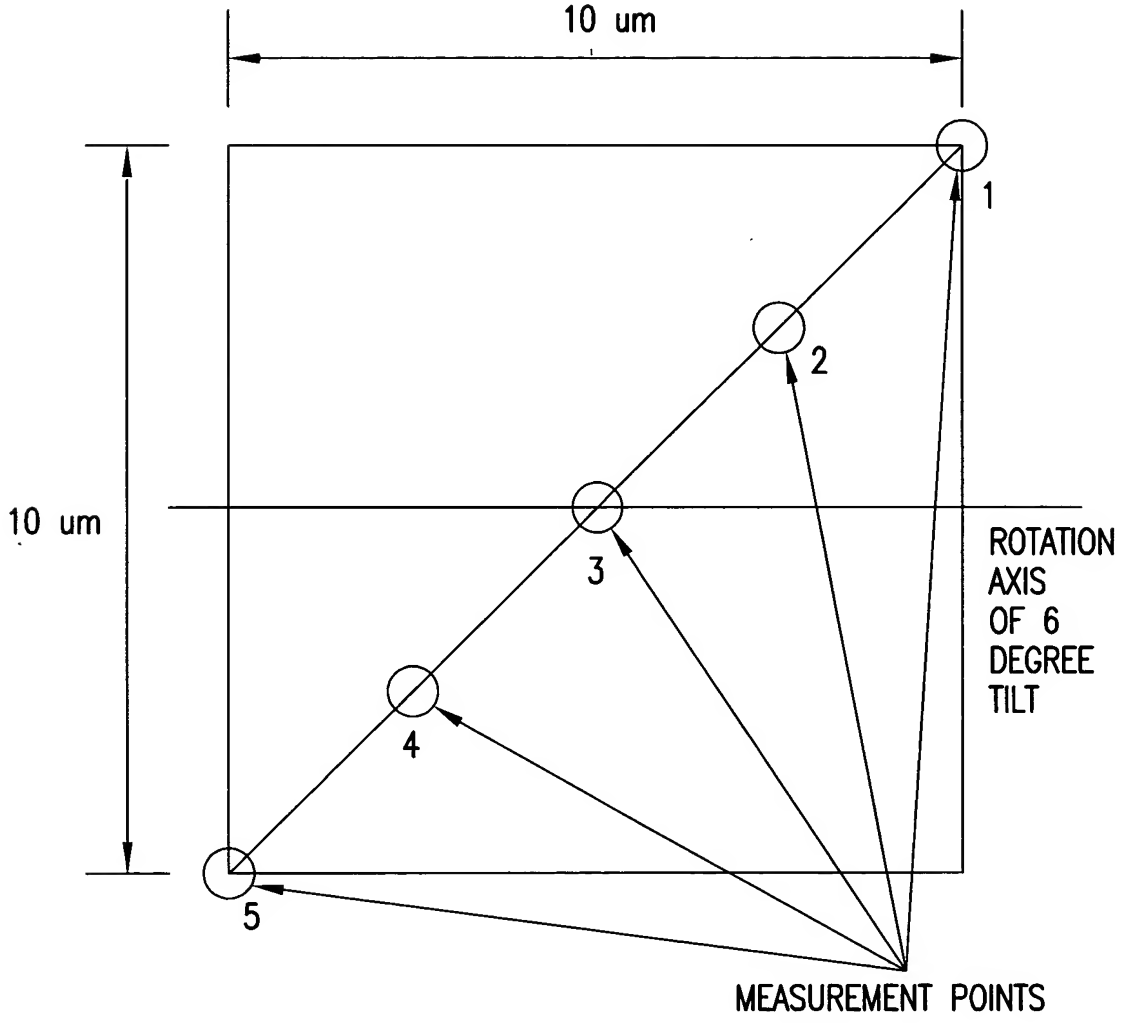
10 um
10 um
1
2
3
4
5
ROTATION AXIS OF 6 DEGREE TILT
MEASUREMENT POINTS

FIG.20

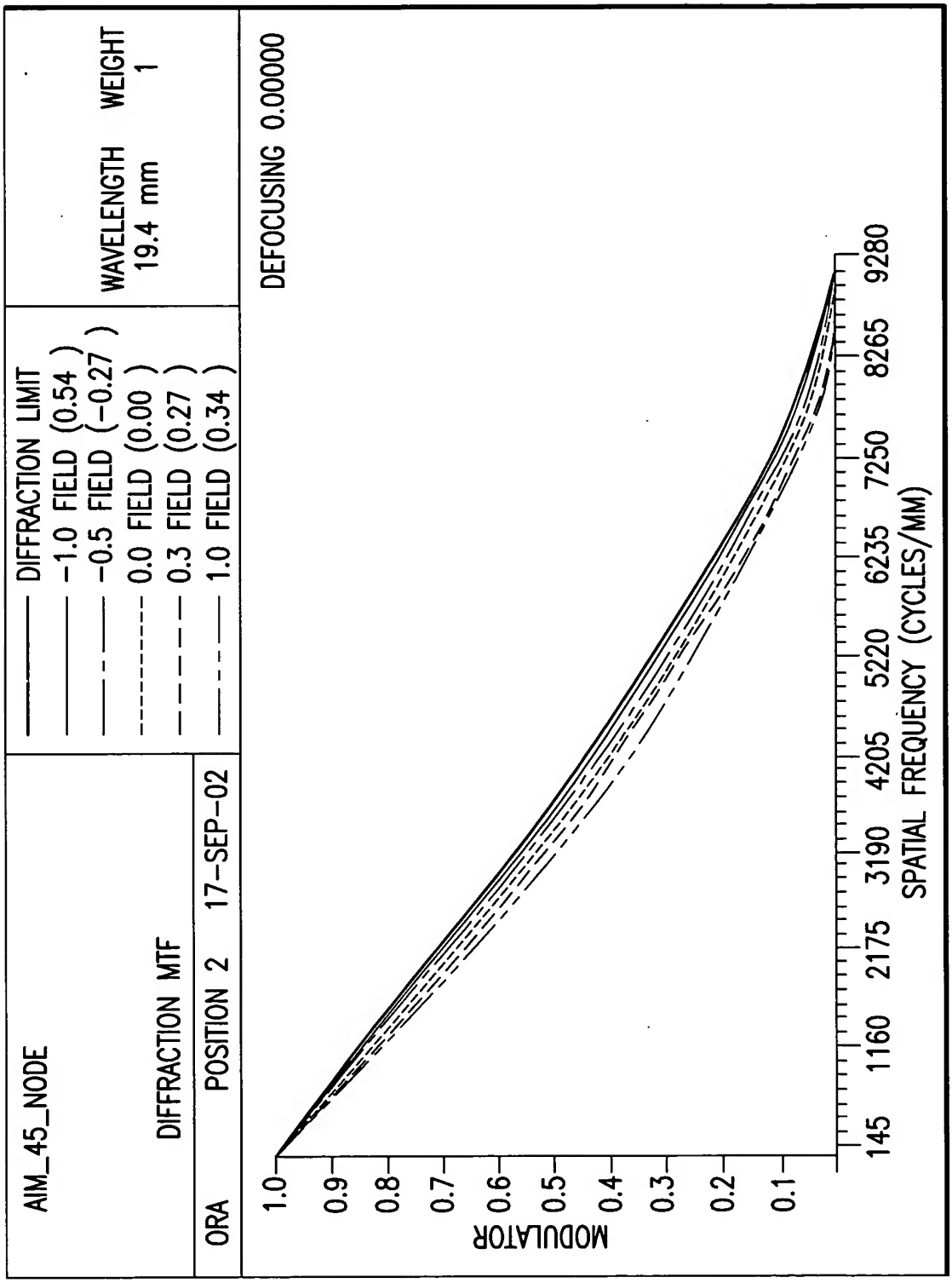
AIM_45_NODE
DIFFRACTION MTF
ORA POSITION 2 17-SEP-02
DIFFRACTION LIMIT
-1.0 FIELD (0.54)
-0.5 FIELD (-0.27)
0.0 FIELD (0.00)
0.3 FIELD (0.27)
1.0 FIELD (0.34)
WAVELENGTH WEIGHT
19.4 mm 1
DEFOCUSING 0.00000
MODULATOR
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
145 1160 2175 3190 4205 5220 6235 7250 8265 9280
SPATIAL FREQUENCY (CYCLES/MM)

FIG.21

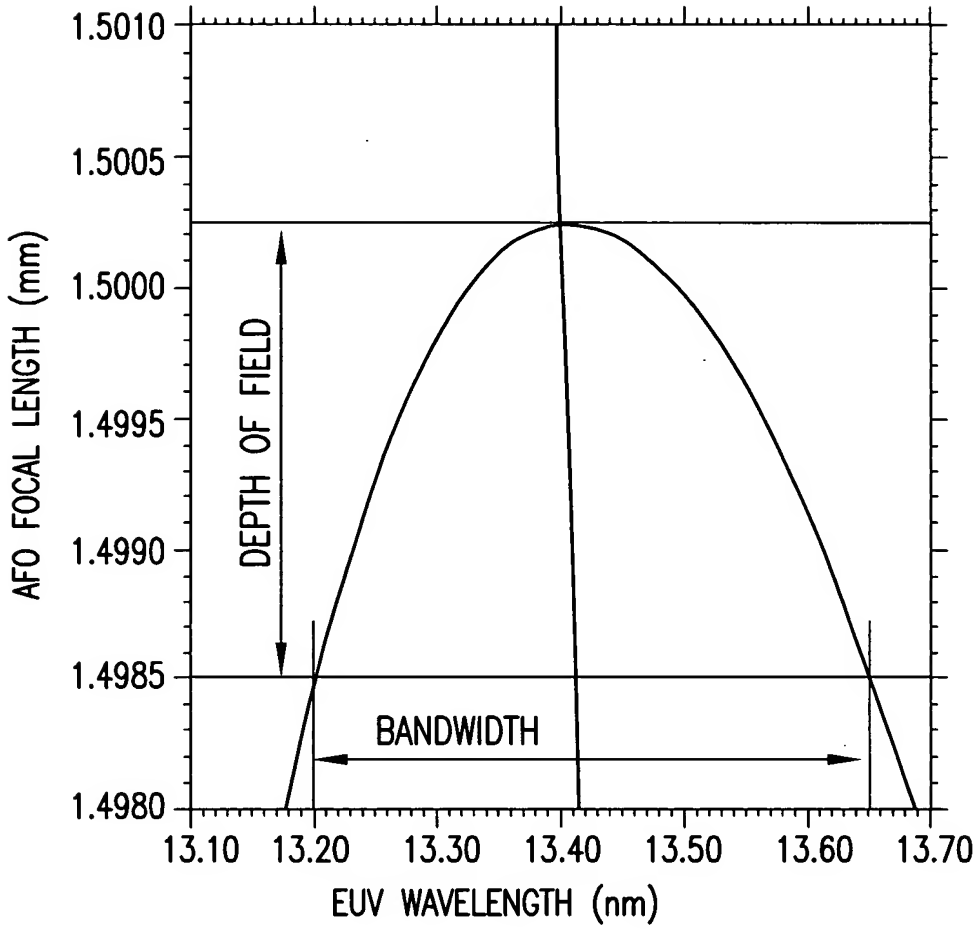
1.5010
1.5005
1.5000
1.4995
1.4990
1.4985
1.4980
AFO FOCAL LENGTH (mm)
DEPTH OF FIELD
BANDWIDTH
13.10
13.20
13.30
13.40
13.50
13.60
13.70
EUV WAVELENGTH (nm)

FIG.22

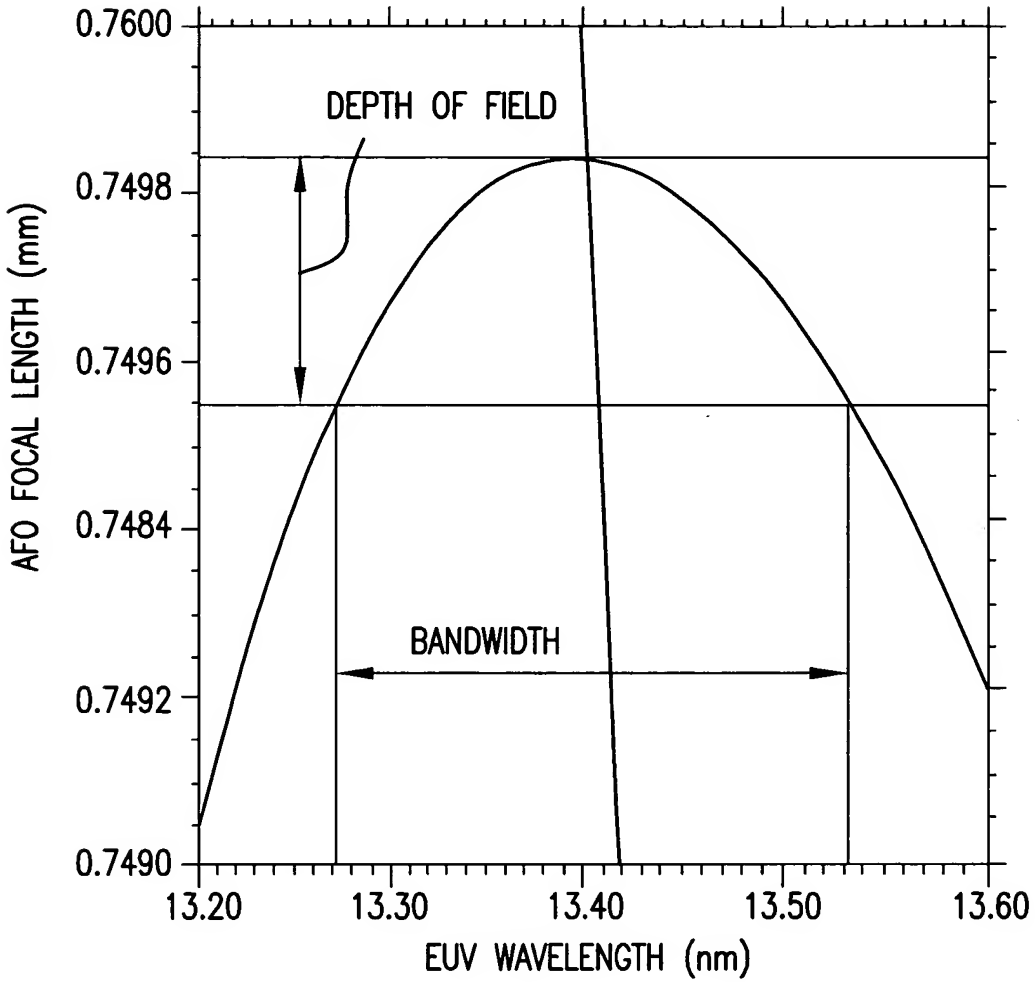
0.7600
0.7498
0.7496
0.7484
0.7492
0.7490
AFO FOCAL LENGTH (mm)
DEPTH OF FIELD
BANDWIDTH
13.20
13.30
13.40
13.50
13.60
EUV WAVELENGTH (nm)

FIG.23

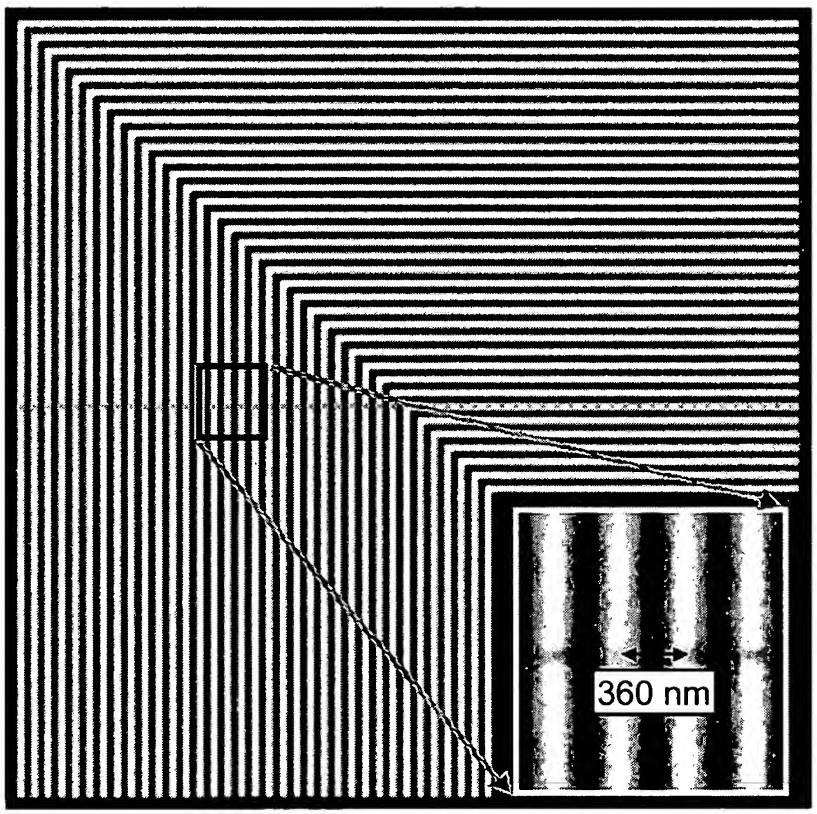

FIG. 24

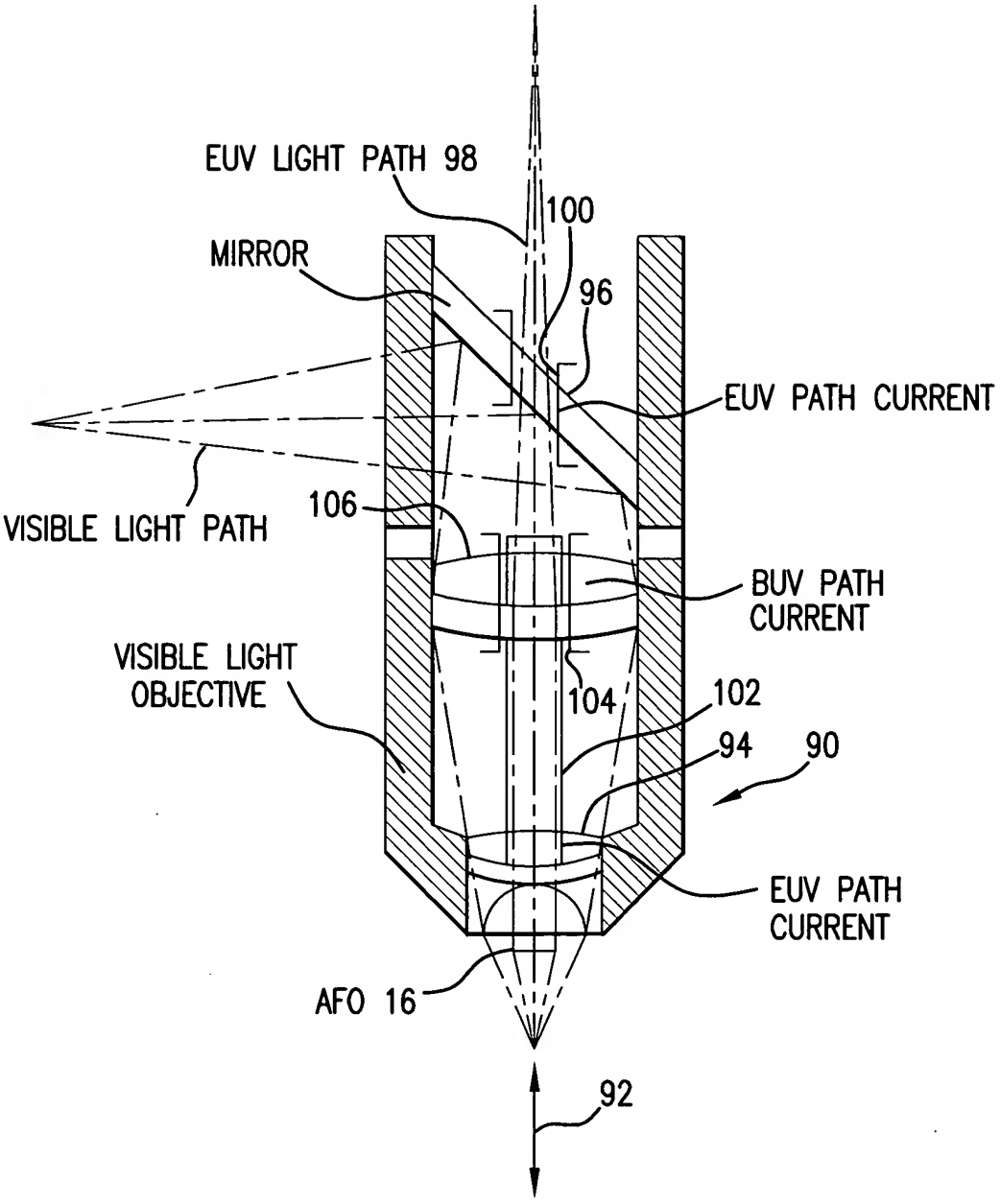
EUV LIGHT PATH 98
100
MIRROR
96
EUV PATH CURRENT
VISIBLE LIGHT PATH
106
BUV PATH CURRENT
VISIBLE LIGHT OBJECTIVE
104
102
94
90
EUV PATH CURRENT
AFO 16
92

FIG.25